In the claims:

1. (Currently amended) A method for removing at least one of thiophene and thiophene compounds from liquid fuel, the method comprising the step of:

contacting the liquid fuel with a dehydrated adsorbent which preferentially adsorbs the at least one of thiophene and thiophene compounds, at a selected temperature and pressure, thereby producing a non-adsorbed component and a thiophene/thiophene compound-rich adsorbed component, wherein the dehydrated adsorbent is dehydrated via heating and includes at least one of a metal and a metal cation, the at least one of metal and metal cation adapted to form π-complexation bonds with the at least one of thiophene and thiophene compounds, and wherein the preferential adsorption occurs by π-complexation, wherein the at least one of metal and metal cation comprises at least one of Mn^{2+}, Fe^{2+}, Co^{2+}, Ni^{2+}, Cu^{+}, Zn^{2+}, Ga^{3+}, Pd^{0}, Ag^{+}, and Cd^{2+}.

2. (Previously presented) The method as defined in claim 1 wherein the dehydrated adsorbent comprises an ion-exchanged zeolite selected from the group consisting of zeolite X, zeolite Y, zeolite LSX, MCM-41 zeolites, silicoaluminophosphates, and mixtures thereof, the zeolite having exchangeable cationic sites, wherein at least one of the sites has the at least one of metal and metal cation present.

3. (Previously presented) The method as defined in claim 2 wherein the dehydrated adsorbent is at least one of Cu(I)Y zeolite, Ag(I)Y zeolite, Ni(II)Y zeolite, and Ni(II)X zeolite.

4. (Cancelled)

5. (Previously presented) The method as defined in claim 1 wherein the dehydrated adsorbent comprises a carrier having a surface area, wherein the at least one of metal and metal cation is in the form of a monolayer metal compound dispersed on the carrier surface area, the metal compound releasably retaining the thiophene/thiophene compounds; and the carrier comprising a plurality of pores having a pore size greater than the effective molecular diameter of the at least one of thiophene and thiophene compounds.

6. (Previously presented) The method as defined in claim 5 wherein the dehydrated adsorbent carrier is silica and wherein the metal compound is silver nitrate.

7. (Cancelled)

8. (Previously presented) The method as defined in claim 1 wherein the method further comprises the step of changing at least one of the pressure and temperature to thereby release the thiophene/thiophene compound-rich component from the dehydrated adsorbent.

9. (Previously presented) The method as defined in claim 1 wherein prior to contacting the liquid fuel with the dehydrated adsorbent, the method further comprises pretreating an adsorbent to form the dehydrated adsorbent, the pretreatment process comprising the steps of:

activating the adsorbent at a temperature between about 250°C and about 600°C in at least one of a dry air atmosphere, air, an inert atmosphere and a reducing atmosphere for an amount of time ranging between about zero hours and about 20 hours; and then

cooling the adsorbent in at least one of a dry air atmosphere, air, and inert atmosphere.

10. (Original) The method as defined in claim 9 wherein the at least one of metal and metal cation is Ni^{2+} and wherein pretreating the adsorbent takes place in at least one of a dry air atmosphere, air, and an inert atmosphere.

11. (Original) The method as defined in claim 9 wherein the at least one of the metal and metal cation is Cu^{+} and wherein activating the adsorbent takes place in at least one of an inert atmosphere and a reducing atmosphere, and wherein the cooling takes place in an inert atmosphere.

12. (Original) The method as defined in claim 11 wherein the reducing atmosphere comprises a reducing gas.

13. (Original) The method as defined in claim 12 wherein the reducing gas comprises at least one of hydrogen and carbon monoxide.

14. (Previously presented) The method as defined in claim 1, further comprising the step of regenerating the dehydrated adsorbent by calcining the dehydrated adsorbent at a temperature and for a length of time sufficient to substantially remove the at least one of thiophene and thiophene compounds.

15. (Original) The method as defined in claim 14 wherein the calcining time ranges between about 0 hours and about 20 hours.

16. (Original) The method as defined in claim 14 wherein the calcining temperature ranges between about 300°C and about 600°C.

17. (Original) The method as defined in claim 14 wherein the at least one of metal and metal cation is Ni^{2+} and calcining takes place in at least one of a dry air atmosphere, air, and inert atmosphere.

18. (Original) The method as defined in claim 14 wherein the at least one of metal and metal cation is Cu^{+} and calcining takes place in at least one of a dry air atmosphere and oxygen atmosphere, and wherein regeneration further comprises the step of reducing copper oxidized during the calcination to Cu(I).

19. (Previously presented) The method as defined in claim 1 wherein the dehydrated adsorbent is adapted to adsorb aromatic compounds, and wherein the dehydrated adsorbent adsorbs the thiophene/thiophene compounds at least slightly more selectively than the aromatic compounds.

20. (Original) The method as defined in claim 1 wherein the liquid fuel is at least one of gasoline, diesel fuels, coal and shale derived liquid fuels, methanol, and the like.

21. (Previously presented) The process as defined in claim 1 wherein, before contact with the dehydrated adsorbent, the liquid fuel has a high concentration of aromatic compounds, and a low concentration of thiophene/thiophene compounds.

22. (Cancelled)

23. (Original) The method as defined in claim 1 wherein the at least one of metal and metal cation comprises Ni^{2+}.

24. (Original) The method as defined in claim 23 wherein the liquid fuel comprises diesel fuels.

25. (Original) The method as defined in claim 1 wherein the selected temperature and pressure is ambient temperature and ambient pressure.

26. (Previously presented) The process as defined in claim 1 wherein at ambient termperature and 10^{-5} atm vapor pressure, the dehydrated adsorbent adsorbs more than about 1 mmol/gram of the at least one of thiophene and thiophene compounds.

27. (Currently amended) A method for removing at least one of thiophene and thiophene compounds from liquid fuel, the method comprising the steps of:

contacting the liquid fuel with a dehydrated adsorbent which preferentially adsorbs the at least one of thiophene and thiophene compounds, at a selected temperature and pressure, thereby producing a non-adsorbed component and a thiophene/thiophene compound-rich adsorbed component; the dehydrated comprising a carrier having a surface area, the carrier having a monolayer of a metal compound dispersed on substantially the entire surface area, the metal compound comprising at least one of a metal and a metal cation adapted to form π-complexation bonds with the at least one of thiophene and thiophene compounds, and wherein the preferential adsorption occurs by π-complexation, the metal

compound releasably retaining the thiophene compounds; and the carrier comprising a plurality of pores having a pore size greater than the effective molecular diameter of the at least one of thiophene and thiophene compounds; and

changing at least one of the pressure and temperature to thereby release the thiophene/thiophene compound-rich component from the dehydrated adsorbent;

wherein the liquid fuel is at least one of unleaded gasoline and diesel fuel;

and wherein, prior to contacting the liquid fuel with the dehydrated adsorbent, the process comprises pretreating an adsorbent to form the dehydrated adsorbent, the pretreatment process comprising the steps of:

activating an adsorbent to form the dehydrated adsorbent between about 250°C and about 600°C in at least one of a dry air atmosphere, air, an inert atmosphere, and a reducing atmosphere for an amount of time ranging between about 5 hours and about 15 hours; and then

cooling the adsorbent in at least one of a dry air atmosphere and inert atmosphere.

28. (Previously presented) The method as defined in claim 27 wherein at ambient temperature and 10^{-5} atm vapor pressure, the dehydrated adsorbent adsorbs more than about 1 mmol/gram of the at least one of thiophene and thiophene compounds.

29. (Original) The method as defined in claim 27 wherein the at least one of metal and metal cation is Ni^{2+} and wherein pretreating the adsorbent takes place in at least one of a dry air atmosphere, air, and an inert atmosphere.

30. (Original) The method as defined in claim 27 wherein the at least one of the metal and metal cation is Cu^{+} and wherein activating the adsorbent takes place in at least one of an inert atmosphere and a reducing atmosphere, and wherein the cooling takes place in an inert atmosphere.

31. (Prevously presented) The method as defined in claim 27, further comprising the step of regenerating the dehydrated adsorbent by calcining the dehydrated

adsorbent at a temperature and for a length of time sufficient to substantially remove the at least one of thiophene and thiophene compounds.

32. (Original) The method as defined in claim 31 wherein the calcining time ranges between about 6 hours and about 12 hours.

33. (Original) The method as defined in claim 31 wherein the calcining temperature ranges between about 300°C and about 600°C.

34. (Original) The method as defined in claim 31 wherein the at least one of metal and metal cation is Ni^{2+} and calcining takes place in at least one of a dry air atmosphere and inert atmosphere.

35. (Original) The method as defined in claim 31 wherein the at least one of metal and metal cation is Cu^{+} and calcining takes place in at least one of a dry air atmosphere and oxygen atmosphere, and wherein regeneration further comprises the step of reducing copper oxidized during the calcination to Cu(I).

36. (Previously presented) The method as defined in claim 27, further comprising the step of adding a guard bed adjacent an inlet to the dehydrated adsorbent such that the liquid fuel contacts the guard bed prior to contacting the dehydrated adsorbent.

37. (Original) The method as defined in claim 36 wherein the guard bed has as a main component thereof at least one of activated carbon, activated alumina, silica gel, zeolites, clays, pillared clays, diatomaceous earth, porous sorbents, and mixtures thereof.

38. (Original) The method as defined in claim 27 wherein the thiophene compounds include at least one of thiophene, methyl-thiophene, benzothiophene, methyl-benzothiophene, dibenzothiophene, 4-methyl-dibenzothiophene, 4,6-dimethyl-dibenzothiophene, 3,6-dimethyl-dibenzothiophene, and mixtures thereof.

39. (Original) The method as defined in claim 27 wherein the at least one of metal and metal cation comprises at least one of Mn^{2+}, Fe^{2+}, Co^{2+}, Ni^{2+}, Cu^{+}, Zn^{2+}, Ga^{3+}, Pd^{0}, Ag^{+}, and Cd^{2+}.

40. (Original) The method as defined in claim 27 wherein the at least one of metal and metal cation comprises Ni^{2+}.

41. (Original) The method as defined in claim 40 wherein the liquid fuel is diesel fuel.

42. (Original) The method as defined in claim 27 wherein the at least one of metal and metal cation comprises at least one of Cu^{+}, and Ag^{+}.

43-46. (Cancelled)